GEOPHYSICAL INSTITUTE

of the

UNIVERSITY OF ALASKA

INVESTIGATION OF AURORAL ZONE IONOSPHERIC FORWARD SCATTER

Progress Report No. 2

covering the period

1 July 1965 - 30 September 1965

Prepared for

National Aeronautics and Space Administration

Manned Spacecraft Center

under

Contract NSR 02-001-020

Principal Investigator

Glenn M. Stanley

I. INTRODUCTION

The work under this contract is directed towards the investigation of the causes of large enhancements on ionospheric forward scatter signals. A field site is being established at the midpoint of an ionospheric forward scatter circuit between Point Barrow and Anchorage, Alaska. The midpoint is located just south of the auroral zone at Allakaket, Alaska, a remote native village. No power, communications, or housing is available at the village and transportation is limited to river or light aircraft. The previous report discussed the preliminary preparations for the installation of equipment and occupation of the site.

II. SCOPE

During the period covered by this report the equipment and supplies were transported from Bettles, Alaska to Allakaket, Alaska, site construction was essentially completed, a site operator was employed and trained, and partial operation was begun.

III. WORK DONE DURING REPORTING PERIOD

During the last few days of June, the Alaska Air National Guard airlifted most of the supplies and equipment for use at Allakaket to Bettles Field, Alaska. The equipment (approximately 40,000 lbs) was moved to an area adjacent to the Koyukuk River with the aid of the FAA station personnel and their equipment. The arrangements for assistance by the FAA were made through the FAA Area Manager at the Fairbanks office and full and willing cooperation from all FAA personnel was obtained.

It was found that the Koyukuk River was in flood stage and was likely to remain that way for some time as a considerable amount of snow was still left in the mountains. Rather than to delay the installation until low

water it was decided to attempt to move the equipment with the river in flood. Six surplus army assault boats were assembled in such a way as to make three boats (each 20 ft long) and were modified to permit mounting of an outboard engine on each. The equipment and supplies were loaded onto the boats and transported to Allakaket, a distance of 75 miles by river. Figures 1 through 4 show some of the freighting operations. Despite repeated engine failures, high water, serious rapids, and very severe mosquito conditions all of the equipment and supplies were moved to Allakaket within about two weeks.

During the rest of the reporting period most of the efforts were directed towards the construction of the facilities at Allakaket. The instrument trailer was set in place, land was cleared for the erection of the ionosonde antenna, the generator was installed and the power distribution system was completed, the ionosonde antenna (115 ft in height) was erected, living quarters were repaired, all-sky camera buildings were installed, and the various instruments were set up and tested.

During the summer mosquito conditions were very severe. It was necessary to procure mosquito spray and to have the area sprayed twice from the air during the summer in order for workmen to remain outside. Until the area was sprayed, it was necessary to wear headnets and gloves most of the day.

The Allakaket airstrip was further damaged by the flooding conditions and became unsafe for operation. It was necessary to spend a considerable amount of time in repair of the airstrip. A D-6 bulldozer and a pull grader were procured from the village and the strip was lengthened, widened and smoothed.

The communications link was installed between Indian Mountain and Allakaket.

A station operator was employed and trained at College. After a short training period the operator was sent to Allakaket.

Ionosonde operations began on a regular basis on 10 September, 1966.

IV. ANALYSIS

No analysis was done during this period.

V. FUTURE PLANS

Because the costs of installation and operation have been considerably less than anticipated due to the assistance of the Alaska Air National Guard, the FAA, Department of Education, State of Alaska and others, we now plan to occupy the site on a continuous basis until spring. It is hoped that we will be able to obtain continuous data from September, 1965 until May, 1966.

LIST OF ILLUSTRATIONS


64392